IN THE CLAIMS

The following claim set replaces all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for removing excess fluid from a patient comprising ~~the steps of~~:

a. inserting a withdrawal catheter into a first peripheral blood vessel in the patient;

b. ~~removing~~withdrawing blood ~~directly from~~ through the catheter in the ~~a~~ first peripheral blood vessel in the patient;

c. sensing a withdrawal pressure of the blood;

d. adjusting a withdrawal blood flow rate based on the sensed withdrawal pressure;

e~~b~~. filtering the ~~removed~~ withdrawn blood through a filter to separate the excess fluid from the blood, wherein the filter has a filter membrane surface area of no greater than 0.2 m^2;

f~~c~~. ~~returning~~ infusing the filtered blood into a second peripheral blood vessel in the patient;

g~~d~~. wherein a blood flow through the filter is less than two percent of a total cardiac output of the patient, and a flow of the excess fluid removed from the blood is no greater than 1.0 liters per hour.

2. (Previously Presented) A method as in claim 1 wherein the excess fluid removed from the blood is no greater than 30 percent of a volume of the removed blood.

3. (Previously Presented) A method as in claim 1 wherein the step of filtering is performed by sieving the blood through a filter to remove excess fluid.

4. (Currently Amended) A method as in claim 1 further comprising the step of pumping the ~~removed~~ withdrawn blood with a blood pump at a rate of less than 100 milliliters (ml) per minute.

5. (Cancelled)

6. (Currently Amended) A method as in claim 1 wherein a rate of ~~the removal of~~ blood withdrawal is in a range of 40 to 60 milliliters per minute, and a rate of removal of the excess fluid is no greater than 16 milliliters per minute.

7. (Cancelled)

8. (Currently Amended) A method as in claim 4 wherein the blood pump stops upon detection of a blockage of blood flow in the blood being ~~removed in step (a)~~ withdrawn.

9. (Currently Amended) A method as in claim 1 wherein the blood pump stops upon detection of a air bubble in the withdrawn or filtered blood ~~during any of steps (a), (b) and (c)~~.

10. (Original) A method as in claim 1 wherein the first peripheral blood vessel is a vein.

11. (Original) A method as in claim 1 wherein the second peripheral blood vessel is a vein.

12. (Original) A method as in claim 1 wherein the first and second peripheral blood vessel are the same vein.

13. (Original) A method as in claim 1 wherein the filter includes capillary, hollow fibers.

14. (Original) A method as in claim 13 wherein the hollow fibers have filtering pores which retain in the blood solutes greater than 50,000 Daltons.

15. (Original) A method as in claim 13 wherein the hollow fibers have blood passages of approximately 0.2 mm or less in diameter.

16. (Cancelled)

17. (Original) A method as in claim 1 wherein the blood flow through the filter causes a wall shear rate of the blood between 1,000 sec^{-1} per seconds and 2,500 per seconds.

18. (Original) A method as in claim 1 wherein the filtration is ultrafiltration.

19. (Original) A method as in claim 1 further comprising minimizing extraction of solutes during filtration.

20. (Original) A method as in claim 1 further comprising extracting primarily water as the fluid removed from the blood during filtration.

21. (Original) A method as in claim 1 wherein blood flows continuously through the filter during periods in which a blood pump is pumping the removed blood.

22. (Original) A method as in claim 1 wherein excess fluid removed from blood flows intermittently from the filter.

23. (Original) A method as in claim 22 wherein a valve in a flow path from the filter for removal of excess fluid cyclically stops and starts the flow of excess fluid from the filter.

24. (Original) A method as in claim 1 wherein a total amount of extracorporeal blood is not greater than 100 milliliters.

25. (Original) A method as in claim 1 wherein said fiber includes less than 1000 filtering fibers.

26. (Currently Amended) A method as in claim 1 wherein the withdrawn blood ~~removed during step (a)~~ is returned to the patient ~~in step (b)~~ within two minutes.

27. (Currently Amended) A method for removing excess ~~water~~fluid from a patient comprising ~~the steps of~~:

a. withdrawing blood from a catheter inserted into a first blood vessel of the patient;

b. ~~removing blood directly from a first peripheral blood vessel in the patient~~monitoring a pressure of the blood being withdrawn and controlling a blood withdrawal rate based on the monitored pressure;

~~b~~c. condensing the ~~removed~~ withdrawn blood through a filter to separate the excess water from the blood, wherein the filter has filter membrane surface area of no greater than 0.2 m^2;

~~c~~d. returning the condensed blood into a second ~~peripheral~~ blood vessel in the patient;

~~d~~e. wherein a blood flow through the filter is less than two percent of a total cardiac output of the patient, and a flow of the excess fluid removed from the blood is no greater than 1.0 liters per hour.

28. (Previously Presented) A method as in claim 27 wherein the excess fluid removed from the blood is no greater than 30 percent of a volume of the removed blood.

29. (Original) A method as in claim 27 wherein the step of filtering is performed by sieving the blood through a filter to remove excess water.

30. (Original) A method as in claim 27 further comprising the step of pumping the removed blood with a blood pump at a rate of less than 100 milliliters (ml) per minute.

31. (Original) A method as in claim 27 wherein a rate of the removal of blood is no greater than 60 milliliters per minute, and a rate of removal of the excess water is no greater than 16 milliliters per minute.

32. (Previously Presented) A method as in claim 27 wherein a rate of the removal of blood is in a range of 40 to 60 milliliters per minute, and a rate of removal of the excess water is no greater than 16 milliliters per minute.

33. (Cancelled) .

34. (Currently Amended) A method as in claim 30 wherein the blood pump stops upon detection of a blockage of blood flow in the blood being removed in step (~~a~~b).

35. (Currently Amended) A method as in claim 30 wherein the blood pump stops upon detection of a air bubble in the blood during any of steps (~~a~~b), (~~b~~c) and (~~c~~d).

36. (Original) A method as in claim 27 wherein the first peripheral blood vessel is a vein.

37. (Original) A method as in claim 27 wherein the second peripheral blood vessel is a vein.

38. (Original) A method as in claim 27 wherein the first and second peripheral blood vessel are the same vein.

39. (Original) A method as in claim 27 wherein the filter includes capillary, hollow fibers.

40. (Original) A method as in claim 39 wherein the hollow fibers have filtering pores which retain in the blood solutes greater than 50,000 Daltons.

41. (Original) A method as in claim 39 wherein the hollow fibers have blood passages of approximately 0.2 mm or less in diameter.

42. (Currently Amended) A method as in claim 38 wherein the filter has a trans-membrane pressure (TMP) no greater than 250 millimeters (mm) of mercury (Hg).

43. (Original) A method as in claim 27 wherein the blood flow through the filter causes a shear rate of the blood between 1,000 sec^{-1} per seconds and 2,500 per seconds.

44. (Original) A method as in claim 27 wherein the filtration is ultrafiltration.

45. (Original) A method as in claim 27 further comprising minimizing extraction of solutes during filtration.

46. (Original) A method as in claim 27 wherein blood flows continuously through the filter during periods in which a blood pump is pumping the removed blood.

47. (Original) A method as in claim 27 wherein excess water removed from the blood flows intermittently from the filter.

48. (Original) A method as in claim 47 wherein a valve in a flow path from the filter for removal of excess water cyclically stops and starts the flow of excess water from the filter.

49 through 54 (Cancelled).

55. (New) A method for filtering blood comprising:

Withdrawing blood from an adult patient;

Filtering the withdrawn blood in a filter having an active filter membrane surface of no greater than 0.2 millimeters squared to remove filtrate from the blood, and

Infusing treated blood into the adult patient.

56. (New) A method as in claim 55 wherein the active filter membrane surface is no greater than 0.1 m^2.

57. (New) A method as in claim 55 further comprising removing the filtrate at a rate no greater than one liter per hour.

58. (New) A method as in claim 55 further comprising withdrawing the blood in a range of 10 to 60 milliliters per minute.

59. (New) A method as in claim 55 further comprising passing the blood through a blood circuit comprising the filter during a residence time period of no greater than 120 seconds.

60. (New) A method as in claim 55 further comprising passing the blood through filter fibers having a length of at least 20 centimeters.

61. (New) A method as in claim 55 further comprising passing the blood through a bundle of filter fibers having at least 620 fibers.

62. (New) A method as in claim 55 wherein said filter has a length of at least 20 cm and an internal diameter of no greater than 1.5 cm.

63. (New) A method as in claim 55 further comprising a shear rate of blood flowing through the filter of at least 1000 per second.

64. (New) A filter for an extracorporeal blood circuit having an input for blood withdrawn from a human patient and a blood output for filtered blood to be infused into the patient, said filter comprising:

a filter body having a length of at least 20 centimeters (cm) and an interior diameter of no greater than 1.5 cm;

an input at a first end of the body to receive the withdrawn blood;

an output at a second end of the body to discharge the filtered blood;

a filter membrane in the body defining a blood passage through the body, wherein the membrane has an active filter membrane surface area of no greater than 0.2 meters squared (m^2), and

a filtrate output to the body and open to a side of the filter surface area opposite to the blood passage.

65. (New) A filter as in claim 64 wherein the active filter membrane surface area is no greater than 0.1 m^2.

66. (New) A method as in claim 64 wherein a volume of the blood passage in the filter is less than two percent of a cardiac output of an adult.

67. (New) A method as in claim 64 wherein the filter membrane surface is an interior surface of a bundle of filter fibers.

68. (New) A method as in claim 67 wherein the filter fibers have a length of at least 20 centimeters.

69. (New) A method as in claim 67 wherein the bundle of filter fibers has at least 620 fibers.